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Before the
Federal Communications Commission
Washington DC 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Amendment of Parts 2 and 90 of the	)	RM-_____
Commission's Rules to Provide for an	)	
Emergency Vehicle Signaling Service	)	

Petition for Rulemaking of ADiCorp

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TABLE OF CONTENTS

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	)	
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Pursuant to Section 1.401 of the Commission's Rules, Alert Devices International Corporation (ADiCorp) submits this Petition for Rulemaking to provide for an Emergency Vehicle Signaling Service (EVSS). Under rigid safeguards to limit unintended reception, EVSS will alert motorists via AM and FM car radios of a public safety vehicle in an emergency response situation nearby.

A. Summary

In the course of two recent years, 101 people died in their cars in collisions with an emergency vehicle that had its lights flashing and/or siren activated. The conclusion is inescapable: lights and sirens do not provide adequate warning. They may have been enough a century ago, when they first came into use, but today they may not provide enough warning to a driver encased in a nearly-airtight car with factory-tinted windows and the radio playing. People are dying as a result.

ADiCorp proposes a measure that will help: a simple device in the emergency vehicle that relays a warning through the car radio.

Our proposal specifically limits eligibility, allowable operation, and power, which together significantly reduce unintended reception. Because AM and FM radio signals are non-directional, at least when transmitted from an antenna small enough to carry on a vehicle, the

signal may briefly reach some listeners not in the path of the responding emergency vehicle. The rule proposal is designed and calculated to provide an effective warning while minimizing listener interruptions as to both frequency and duration.

We ask the Commission to authorize an Emergency Vehicle Signaling Service (EVSS) with the following mandatory safeguards:

- eligibility strictly limited to police, fire, ambulance, and closely similar emergency responders;
- operation only while the emergency vehicle is moving *and* while its siren and/or flashing lights are operating; and
- strict power limits tied to the vehicle speed, with sharply lower limits when vehicle speed drops.

In addition, to maintain the integrity of the Emergency Alert System (EAS), the transmitter must monitor the EAS attention signal of primary EAS stations, turn off automatically on receipt of an EAS attention signal, and remain off for the duration of the EAS transmission.

Finally, if the Commission receives credible interference reports that suggest an EVSS licensee is operating out of compliance, it should be able to suspend the licensee's operations without prior notice -- or, if the interference is severe and the Commission cannot immediately identify the responsible licensee, then to suspend all EVSS operations in the area.

These safeguards should ensure that any listener interruptions are pertinent, rare, and brief. We are confident that most people will accept an occasional, momentary inconvenience in exchange for better public safety protection, in the same spirit that we tolerate the sound of a passing siren. Lives will be saved as a result.

B. Background

George E. Derome, Jr. (later the founder of ADiCorp) was on duty as a Massachusetts State Trooper in the early morning of November 16, 1983. At 2:02 am, while Trooper Derome was securing an accident scene, an oncoming car crossed the flare barrier at over 50 miles per hour and ran him down.

Trooper Derome narrowly escaped death, but his injuries were severe. Every bone on his left side was broken and his lower left leg was badly mangled. The injuries forced his retirement. Today, twenty years later, Mr. Derome's left leg remains visibly deformed even after 47 major surgeries and innumerable other procedures.

People who have undergone a devastating injury often find themselves dwelling on how it might have been prevented. Mr. Derome had plenty of time in the hospital and afterward to think about roadway accidents involving emergency personnel and how they might be avoided. In 1999, he founded ADiCorp to manufacture a simple, inexpensive device that could well prevent thousands of such accidents -- although, ironically, it probably would not have prevented his own.

C. Proposed Emergency Vehicle Signaling Service

ADiCorp requests minimal changes to Parts 2 and 90 of the Commission's Rules to provide for a new Emergency Vehicle Signaling Service (EVSS). The purpose of EVSS is to alert motorists to a public safety vehicle in an emergency response situation nearby. The alerting message transmits directly from the public safety vehicle to AM and FM car radios. Below, we propose service and technical rules that will limit the signaling *only* to public safety vehicles, only while on emergency calls, only over a short range, and only for a few seconds at any location.

Car radios in the immediate vicinity receive a short prerecorded voice message preceded by a warning tone. An example: "Beep -- beep -- beep -- warning, approaching emergency vehicle." The estimated range is 200-800 feet. The transmitter power -- and hence the range -- reduce automatically as the vehicle speed slows, and the transmitter cuts off automatically when the vehicle has been stopped for nine seconds.

Eligibility. We propose that EVSS eligibility be limited to the entities specified in Sections 90.20(a)(1) and 90.20(a)(2)(I)-(iv) & (ix). These include state and local governments, along with non-government entities that provide fire protection, forestry conservation, certain health care (including ambulance service), rescue squads, and beach patrols. Federal governmental agencies engaged in emergency response should also be permitted to use EVSS. The eligibility proposal *excludes* public safety categories such as disabled individuals, veterinarians, school bus operators, communications common carriers, and private security companies. Although we do not question the importance of these groups' communications, we submit that their vehicle operations are not so urgent as to warrant EVSS authority.

Secondary status. We propose that EVSS be secondary to the AM and FM Broadcast Radio Services. Because only a small number of entities will be eligible for EVSS licenses, and because most of those (except for state police) will operate in only a small area, identifying sources of any interference should be straightforward. Additionally, we propose an extraordinary remedy to aid in preventing interference. If the Commission receives credible interference reports that suggest an EVSS transmitter is operating in violation of the rules -- for example, if interference is other than very brief -- the Commission may immediately suspend a suspected licensee's EVSS operations, pending investigation. Furthermore, if the interference is severe and the Commission cannot promptly identify which EVSS licensee in an area may be out

of compliance, the Commission may suspend EVSS operations of *all* licensees operating in the area where the severe interference occurred.

D. Benefits for Emergency Personnel and Public Safety

It is a calculated risk whenever a police officer, fire fighter, or ambulance driver activates the lights and siren and enters traffic. Early arrival at the emergency scene (or the hospital) unquestionably saves lives, reduces injuries, and minimizes property loss. But with these benefits comes the risk of an accident along the way.

Surprises on the road are always dangerous. To other drivers, an emergency vehicle is a surprise -- a fast-moving object that can appear unexpectedly, outside the usual flow of traffic, ignoring the usual rules and customs of the roadway. If a driver fails to see the vehicle in time to respond -- or is startled and responds incorrectly -- the result can be a high-speed accident. That not only prevents help from reaching the original emergency, but creates a new one that may be worse.

In the years 2000-2001 -- the most recent for which data are available -- 156 people died in crashes involving ambulances, fire vehicles, and police vehicles in emergency use with sirens and/or lights operating. Of those, 101 (almost two-thirds) died in another vehicle -- all potential beneficiaries of EVSS.

	Ambulance	Fire	Police	TOTAL
Em. Vehicle Driver	1	4	15	**20**
Em. Vehicle Passenger	7	4	5	**16**
Pedestrian / Bicycle	3	2	14	**19**
Other Vehicle	*24*	*17*	*60*	***101***
TOTAL	**35**	**27**	**94**	**156**

Fatalities Involving Emergency Vehicles in Emergency Use 2000-2001[1]

The number of injuries in crashes involving emergency vehicles with sirens or lights on was over 11,500.[2] Again, it is likely that most of those injured were in other vehicles.

One key to avoiding these accidents is to give other drivers enough warning of the emergency vehicle's approach. Today the only warnings available are the century-old siren and flashing lights. For drivers cocooned in technologically advanced automobiles with the factory-tinted windows closed and the radio playing, common sense tells us those antiquated devices are not enough. The accident data agree.

EVSS adds an additional layer of warning. Under the technical standards outlined below, EVSS will give motorists additional safe reaction time. Along with the siren and flashing lights, that could make the difference between a successful emergency run and a disaster.

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[1] Sources: U.S. Dept. of Transportation, Nat'l Highway Traffic Safety Admin., *Traffic Safety Facts 2001* at 94, Table 62 (Dec. 2002); U.S. Dept. of Transportation. Nat'l Highway Traffic Safety Admin., *Traffic Safety Facts 2000* at 94, Table 62 (Dec. 2001).

[2] This is an estimate from the average of 74 injuries for every fatality in vehicle crashes in 2000-2001. U.S. Dept. of Transportation, Nat'l Highway Traffic Safety Admin., *Traffic Safety Facts 2001* at 15, Table 2 (Dec. 2002); U.S. Dept. of Transportation. Nat'l Highway Traffic Safety Admin., *Traffic Safety Facts 2000* at 15, Table 2 (Dec. 2001).

In addition to cutting accident risks, EVSS will help emergency vehicles get through traffic more quickly. This not only speeds response to the emergency, but also makes more efficient use of emergency vehicles and their personnel, helping to cut costs for financially-pressed first responders.

E. Minimal Burden on the Public

EVSS signals are necessarily non-directional, because directional antennas at AM and FM broadcast wavelengths are too large for mobile use. As a result, northbound cars may pick up fleeting EVSS signals from emergency vehicles passing southbound, much as northbound traffic hears sirens from the southbound roadway.

The rules proposed here minimize both the number of receivers affected and the duration of any interruption. The rules strictly limit EVSS power, and reduce power even further in direct correlation as the vehicle slows. The EVSS cannot transmit unless the vehicle's siren and/or flashing lights are operating. And transmission must cease within seconds after the vehicle comes to a stop. These requirements help to ensure that any interruptions are due to close proximity of an approaching emergency vehicle and that unintended reception is minimal.

The public has shown it is willing to accept an occasional, brief imposition in exchange for improved safety services. A familiar example is the siren long used on police cars, ambulances, and fire vehicles. The sound is irritating -- intentionally so, as it is meant to attract attention -- but it passes quickly. Here in Washington, the fire-vehicle sirens and exhaust whistles are so loud as to stop conversation on the street for a block around, yet no one doubts their necessity.

Roadway design also minimizes the impact on home listeners. EVSS transmissions will be most frequent on roads with the highest traffic density. But the wide right-of-way on such

roads insures a minimum distance between vehicles and residences, and the traffic generally moves fast, ensuring that any interruptions will be short. On residential side streets, the reduced EVSS power associated with lower vehicle speeds will likewise keep interruptions rare and brief.

Based on the technical rules below, we estimate that an EVSS message will have little more audible impact on unintended recipients than the emergency vehicle's siren. We submit this is a minor inconvenience at worst, and a fair exchange for helping emergency vehicles get to their destinations more quickly and safely.

F. Emergency Alert System

The Emergency Alert System (EAS) operates over AM, FM, and TV broadcast stations, as well as cable systems and other participating entities, to warn the public of national, state, or local emergencies.

We propose rules to ensure that EVSS does not interfere with the public's reception of EAS messages. Specifically, we recommend the Commission require an EVSS transmitter to monitor primary EAS stations in the market for the EAS attention signal, to turn off automatically on its receipt, and to remain off for the duration of the EAS transmission.

G. Technical Considerations

So as to restrict EVSS transmissions to emergency situations, we propose rules (Part J, below) that subject the EVSS transmitter to the following constraints:

- the transmitter operates only when the vehicle is in motion *and* the siren and/or flashing lights are operating;
- the transmitter operates at very low power at low speeds, and transmits at slightly higher power only at higher speeds;
- the transmitter turns off automatically when the vehicle comes to rest for 9 seconds *or* the siren and flashing lights are turned off; and

- the transmitter monitors primary EAS stations and turns off automatically on receipt of an EAS attention signal for the duration of the EAS transmission.

At emergency vehicle speeds above 60 mph, we suggest a maximum power per channel of 45 milliwatts (AM and FM). The proposed limit below 20 mph is 15 milliwatts, and varies smoothly between 20 and 60, as shown in the table:

Speed	Max. Power per Channel	
	AM	FM
Stopped	*transmitter off*	*transmitter off*
in motion below 20 mph	15 mW	15 mW
between 20 and 60 mph	(*speed in mph*) x 0.75 mW	(*speed in mph*) x 0.75 mW
above 60 mph	45 mW	45 mW

Proposed EVSS Power Limits

The 60 mph range is likely to be achieved only on high-speed roadways, which tend to be well separated from residences. Listeners on residential streets will generally be subject to lower-power, shorter-range operation, so that interference, if any, will be brief.[3]

H. Effectiveness

The EVSS signal successfully "captures" a car radio tuned to a broadcast station, even though the broadcast transmitter may be a million times more powerful than the EVSS device. There are three reasons.

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[3] Due to unavailability of IBOC digital FM and AM receivers, we are unable to run comprehensive tests on how EVSS affects such receivers. We will conduct tests as IBOC systems deploy, and will redesign later versions of the EVSS transmitter to make EVSS compatible with IBOC transmissions, following the same principles outlined above.

First, the EVSS device is much closer to the car radio than the broadcast transmitter. Under ideal conditions, signal strength at the receiver depends on the *square* of the distance to the transmitter. Thus, two transmitters deliver equal signals to a receiver if one is a million times more powerful, but only a thousand times farther away. In actual practice, the more distant broadcast signal is attenuated even more by terrain, intervening buildings, etc., while the EVSS transmitter almost always has direct line-of-sight to the car radio.

Second, the EVSS signal is not only relatively strong at the car radio, but is steadier and "cleaner" than the broadcast signal. The signal path between a broadcast transmitter and a moving car is a constantly shifting configuration of obstacles and reflections. The EVSS signal, with advantages of line-of-sight and proximity, is more likely to be captured by the car radio.

Third, the ADiCorp unit transmits slightly off-center in the broadcast channel. Car radios are designed to accommodate off-center signals, because the received frequency rises or falls as the vehicle travels toward or away from the broadcast transmitter. (This is called the Doppler effect.) A car radio in the presence of an EVSS-equipped emergency vehicle sees two competing signals: EVSS and a broadcast station. The broadcast signal is weakened and fluctuating due to distance and terrain, while the EVSS signal in direct line-of-sight is stable and steady. Moreover, because it is off-center, the EVSS signal misses the frequency containing the highest levels of the broadcast signal's energy. Under these conditions, the car radio preferentially captures the cleaner EVSS signal, despite its vastly lower transmitter power. Home radios, in contrast, receive a steadier signal from the broadcast station, and so are more

likely to stay on that frequency and reject the fluctuating EVSS signal from a passing emergency vehicle.[4]

The EVSS signal will not reach every car, perhaps not even a majority. But that is not necessary for EVSS to be fully effective. The drivers that do pick up the signal will check their mirrors for the emergency vehicle, then slow down and move right. When drivers behind them see brakelights and right-turn signals coming on, they look around to see why, spot the emergency vehicle, and then they too brake and move right. That alerts still other drivers in a "wave effect" that propagates along the highway ahead of the emergency vehicle. The result is a clearer path for the emergency vehicle, even though not all cars have received the EVSS signal.

I. Legal Considerations

Congress created the Commission in part "for the purpose of promoting safety of life and property through the use of wire and radio communication."[5] The rules requested here support that mandate.

Nothing in this Petition is inconsistent with the Communications Act. The only provision that could conceivably apply is Section 333, which states:

> No person shall willfully or maliciously interfere with or cause interference to any radio communications of any station licensed or authorized by or under this Act or operated by the United States Government.

Congress added this provision in 1990 to arm the Commission in its fight against deliberate interference in the amateur, maritime, and citizens band services, and also to public safety,

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[4] The discussion applies to FM radios, which account for the large majority of listeners. AM listeners may hear the EVSS signal mixed in with the broadcast.

[5] 47 U.S.C. Sec. 151.

private land mobile, cable television, and Government operations.[6] The legislative target was radio signals transmitted, not for purposes of communication, but solely to block others' communications.[7] Even though EVSS may cause brief interference under some circumstances, it is far outside the legislative intent behind Section 333.

We can find only one case that applies Section 333. In *Rocky Mountain Radar, Inc. v. FCC*,[8] a manufacturer challenged the Commission's banning a device that intentionally jammed police radar. The case turned on whether the device "generates" radio-frequency energy, as that term is used in a Commission regulation. The Tenth Circuit upheld the Commission on the principle that a reviewing court must give "substantial deference to [the agency's] interpretation of its own regulations," especially when it "calls upon the agency's unique expertise."[9] Under the logic of the case, we would expect the court to give the same substantial deference to a regulation that authorizes EVSS promulgated in the Commission's exercise of its technical expertise.

In short, we can find no statutory barrier to the adoption of EVSS.

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[6] P.L. 101-396, H. Rep. 316 at 8-9, *reprinted at* 1990 U.S. Code Cong. & Admin. News 1294, 1301-02.

[7] The provision was intended to "prohibit[] intentional jamming, deliberate transmission on top of the transmissions of authorized operators already using specific frequencies in order to obstruct their communications, repeated interruptions, and the use and transmission of whistles, tapes, records, or other types of noisemaking devices to interfere with the communications of or radio signal of other stations." *Id.*

[8] 158 F.3d 1118 (10th Cir. 1998).

[9] *Rocky Mountain Radar*, 158 F.3d at 1123-24 (internal quotation marks and citations omitted).

J. Proposed Rule Language

To implement the foregoing, ADiCorp asks the Commission (1) to amend the Table of Frequency Allocations in Section 2.106 as shown (proposed additions are in **boldface**), and (2) to add a new section to Part 90, Subpart B ("Public Safety Radio Pool"), here denominated Section 90.24.

§ 2.106 Table of Frequency Allocations

[* * *]

United States Table		FCC Rule Part(s)
Federal Government	Non-Federal Government	
535-1605 [kHz]	535-1605 [kHz] BROADCASTING **Mobile** US321 **NGxxx**	Radio Broadcasting (AM) (73) Auxiliary Broadcasting (74) Alaska Fixed (80) Private Land Mobile (90)
1605-1615 [kHz] MOBILE US221 US238	1605-1705 [kHz] BROADCASTING **Mobile**	
1615-1625 [kHz] US238 US299		
1625-1705 [kHz] Radiolocation US238 US299	US238 US299 US321 NG128 **NGxxx**	
[* * *]		
88-108 [MHz] US93	88-108 [MHz] BROADCASTING **Mobile** US93 NG2 NG128 NG129 **NGxxx**	Broadcast Radio (FM) (73) Auxiliary Broadcasting (74) **Private Land Mobile (90)**

[* * *]

Non-Federal Government (NG) Footnotes

[* * *]

NGxxx The 535-1705 kHz band and the 88-108 MHz band are also allocated on a secondary basis to the Emergency Vehicle Signaling Service (EVSS) for the purpose of alerting motorists to a public safety vehicle in motion. EVSS must protect aeronautical navigation operations above 108 MHz.

§ 90.24 Emergency Vehicle Signaling Service (EVSS)

(a) *Purpose*. The EVSS is for the exclusive use of eligible public safety entities to warn motorists of the presence of emergency vehicles in motion.

(b) *Eligibility*. Only entities specified in Sections 90.20(a)(1) and 90.20(a)(2)(I) through (iv) and (ix) may operate transmitters in the EVSS.

(c) *Technical rules*.

(1) Transmissions are limited to the "AM broadcast channels" as defined in Section 73.14 and the FM broadcast channels listed in Section 73.201.

(2) EVSS transmitters may be mounted only in vehicles routinely used to provide emergency services.

(3) Maximum power on any AM channel is 15 milliwatts or 0.75 milliwatts x (vehicle speed in miles per hour), whichever is greater, but not to exceed 45 milliwatts. The out-of-band emissions specified in Section 73.44(b) apply at the upper and lower edges of the AM band, but not between AM channels.

(4) Maximum power on any FM channel is 15 milliwatts or 0.75 milliwatts x (vehicle speed in miles per hour), whichever is greater, but not to exceed 45 milliwatts. The out-of-band emissions specified in Section 73.317(b)-(d) apply at the upper and lower edges of the FM band, but not between FM channels.

(5) The transmitter may operate only while the vehicle siren and/or flashing lights are operating, and must turn off automatically within nine seconds of the vehicle coming to a stop.

(6) An EVSS unit must monitor primary EAS stations for Emergency Alert System attention signals, turn off automatically on detecting such a signal, and remain off for the duration of the Emergency Alert System transmission.

(7) The station identification requirements of Section 90.425 do not apply.

(8) Each transmitter must be certificated pursuant to Part 2 of this Title. The application for certification must specify the proposed means of compliance with paragraphs (5) and (6) of this subsection.

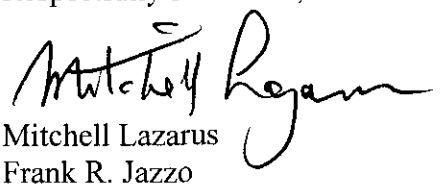
(d) *Suspension.* On receipt of credible reports of interference that suggest operation in violation of these rules, the Commission may immediately suspend a licensee's EVSS operations pending investigation. If the Commission cannot identify a licensee in connection with the reports of severe interference, it may suspend the EVSS operations of all licensees over a reasonable geographic area.

CONCLUSION

The establishment of an Emergency Vehicle Signaling Service will help to avoid high-speed accidents by giving drivers additional warning of an oncoming emergency vehicle. The rules proposed here will minimize any inconvenience to unintended recipients through limiting eligibility, maintaining low power limits, and tying operation to the vehicle siren and flashing lights.

We urge the Commission to issue a Notice of Proposed Rulemaking at the earliest possible date.

Respectfully submitted,



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